

# UNITED STATES PATENT OFFICE.

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## PROCESS OF MANUFACTURING MATRIX-SHEETS.

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*To all whom it may concern:*

Be it known that I, HERRMANN SCHIMANSKY, a subject of the Emperor of Germany, and a resident of Berlin, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Stereotyping Processes, of which the following is a specification.

In stereotyping processes as usually carried out the matrix is made of several sheets of tissue-paper placed one upon the other and united by means of paste or the like and is placed upon the type in the moist state. By continued beating with a brush the type is pressed into the moist matrix. The free spaces which are to remain white in the printing are filled up at the back of the matrix by covering with pieces of pasteboard. Then the matrix, still in the moist state, is completely dried in a hot press or in a drying-furnace. The work of covering up the spaces, which is very troublesome and takes much time, is necessary, because otherwise the hot lead would press down the very thin matrix on the spaces during the casting, and these spaces would have to be again cut out upon the cast plate.

The present dry stereotype process consists in using perfectly-dry matrix-plates of vegetable fiber, which are characterized by great porosity produced artificially, so that the impression of the type to be stereotyped takes place by simply destroying the porosity at the pressed parts, thereby rendering the matrix-plates directly suitable for the casting. As compared with the moist pasted matrices made according to the old process the present dry porous flexible matrix-plate possesses the following great advantages:

First. It does not require to be beaten with the brush. For the beating is substituted the impression, which takes much less time and of course enables the characters to be reproduced much more distinctly and accurately than by any other process.

Second. The manipulation of covering up the free spaces, which takes a great deal of time, is dispensed with, as the matrix-plate retains its original thickness at all free places which are not impressed.

Third. The drying of the matrix, which is so injurious to the type, is obviated, because

this matrix is used in a dry state from the beginning.

For making the plates all kinds of vegetable fibers are appropriate—such as wood, cellulose, hemp, cotton, or flax—or any fiber ordinarily employed in the manufacture of paper and cardboard.

The porosity of the matrix-plates, which is necessary for this dry stereotype process, may be obtained in various manners—for instance, in the following way: The plates, consisting of vegetable fiber, are impregnated with a chemical liquid which being brought in contact with another liquid gives rise to the development of gases. As these gases force their way from the interior of the plate to the outside they loosen the ingredients of the plate—that is to say, the vegetable fiber—in consequence of which the plate becomes porous to a high degree. There are many such chemical substances. By way of example I may mention the following treatment: The plates are first immersed in sodium carbonate and then in an acid—for example, vinegar—thereby developing as a gas carbonic acid, which effects the loosening of the plate. In this manner the porosity of the plate is obtained by loosening alone. Presumably the parts of resinous matter clinging to the fiber dissolve. Under the microscope this operation takes place in a similar manner as when straight fiber is placed upon a hot plate, which, as is well known, also gives rise to the bending by drying. The fiber thus bent is then formed by known means into plates. To this end the fibrous material is treated in a long-sieve paper-machine, similar to roof-paper. Care should, however, be taken to avoid all pressure on the material in order to maintain the porosity. Finally these plates are covered on one side with a thin coat or layer of starch paste, to which, say, five per cent. of glycerin has been added, in order that the adhesion of the metal to the vegetable fiber may be obviated in the casting. The matrix-plate thus produced ready for use may be kept in stock in any quantities in printing-works and used at once when required. It is only necessary to place a piece of matrix-plate corresponding to the size of the type upon the latter and to exert a slight pressure upon it in any suitable